

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

PUBLICATION NUMBER : 02164284  
PUBLICATION DATE : 25-06-90

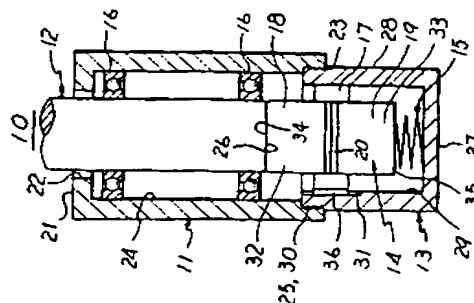
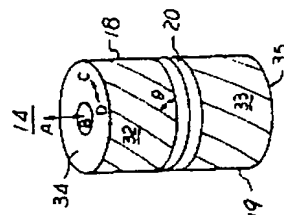
APPLICATION DATE : 12-04-88  
APPLICATION NUMBER : 63090046

APPLICANT : KOTAKI TOMIO;

INVENTOR : KOTAKI TOMIO;

INT.CL. : H02N 2/00

TITLE : ULTRASONIC ACTUATOR



**ABSTRACT :** PURPOSE: To simplify a structure, to facilitate manufacture and to increase the output of an ultrasonic actuator by employing driving elements made of an anisotropically elastic material in which the direction of the maximum longitudinal elastic modulus is inclined at a predetermined oblique angle with respect to its axial direction.

**CONSTITUTION:** The driver 14 of a motor 10 is composed of a pair of driving elements 18, 19, and a piezoelectric element 20 interposed and adhered between the driving elements 18 and 19. The driving elements 18, 19 are resonators composed of anisotropically elastic material. In order to simultaneously generate longitudinal vibration and sliding vibration, the direction of the maximum longitudinal elastic modulus of the anisotropically elastic material is inclined at a predetermined angle  $\theta$  with respect to the circumferential direction at so-called driving element side faces 32, 33. Thus, the longitudinal vibration of the axial direction and the sliding vibration around the axis simultaneously occur at the driver 14, the vibrations are obtained at the end faces 34, 35 of the driving elements to apply a rotary torque to a rotor 12 in contact with the end face 34.

**COPYRIGHT:** (C)1990,JPO&Japio